APPENDIX C • NOTATION

Compiled by Alison Deere and Marjolein Ribberink
University of British Columbia.

Contents

Roman Symbols, Acronyms & Conventions C881
Greek Symbols C885
Operators C887
Subscripts C887
Special Symbols C887

ROMAN SYMBOLS,
ACRONYMS &
CONTRACTIONS

A
Advection of TKE
Albedo
Amplitude
Area
Ball ratio
Balanced initial analysis
North-south amplitude of a wave
Parameter or constant (varies by context)
Absolute angular momentum
Alberta, Canada postal code
Airmass
Aerosol
Albedo of dark-colored daisies
Albedo of bare ground
Above ground level
Aircraft communication and reporting system
Albedo of dark-colored daisies
Albedo of light-colored daisies
Aircraft meteorological data relay
Alaska, USA postal code
Absolute temperature
Al江湖
Ar
Aerosol
Action de Recherche Petite Echelle Grande Echelle (weather-forecast model)
Aircraft to satellite data relay
Automatic surface observing system
Apparent temperature (heat index)

AVCS
Arbitrary vertical cross-section
A
Global albedo corresponding to an atmospheric window
AWOS
Automatic weather observing system
AZ
Arizona, USA postal code
Atmospheric heat index
Attenuation coefficient
Length of semi-major axis of earth’s orbit
Surface albedo
Vector acceleration
Mixed-layer transport coefficient
Inverse of cosine function (cos⁻¹)
Inverse of sine function (sin⁻¹)
Inverse of tangent function (tan⁻¹)
Absorption coefficient
Atmospheres (a pressure unit)

B
Beaufort wind scale
B
Breakdown potential for dry air
B
Buoyant production or consumption of TKE
BC
Boundary conditions
British Columbia, Canada postal code
BLG
Boundary-layer gradient (wind)
BRN
bulk richardson number
BSS
Brier Skill Score
B
Black-body radiation of a certain wave-length
Parameter or constant (varies by context)
Absorption cross section
Damping factor
Extinction cross section
Length of semi-minor axis
Parameter or constant (varies by context)
Parameter or constant (varies by context)
Dimensionless coefficient
Convective transport coefficient

C
Angular rotation in a full circle (360° or 2π radians)
Circle circumference (360° or 2π radians)
Circulation
Climatological conditions
Cost
Dimensionless concentration
Fractional area covered
Parameter or constant (varies by context)
Specific heat capacity
California, USA postal code
Absolute circulation
Canada
Convective Available Potential Energy
Constant altitude plan position indicator
Clear-air turbulence

C
Bernoulli’s constant
Cell circulation
Cloud-to-cloud
Charge-to-coupled devices
Convective condensation level
Cloud condensation nuclei
Drag coefficient
Fraction of the globe covered by dark daisies
Coriolis force
Cort-n-Friedrichs-Lewy (condition for numerical stability)
Cloud-to-ground
Fractional area covered by bare ground
bulk heat-transfer coefficient
Methane
Capping inversion
Conductive inhibition
Classic
Fraction of the globe covered by light daisies
Canadian Meteorological Center
Carbon monoxide
Colorado, USA postal code
Carbon dioxide
Cumulative probability
Specific heat of air at constant pressure
Specific heat of dry air at constant pressure
Specific heat for water vapor at constant pressure
Relative circulation
Cathode Ray Tube
Seed coverage
Critical success index
Connecticut, USA postal code
Cumulus cloud
curve
Specific heat at constant volume
Specific heat of dry air at constant volume
Vertical drag coefficient
Dimensionless cross-wind integrated concentration
Degree Celsius or centigrade, a unit of temperature
Concentration of a pollutant
Density correction factor
Half the distance between two foci of an ellipse
Maximum concentration
Parameter or constant (varies by context)
Phase speed or shallow-water wave speed
Speed of light through air at sea level speed
Speed of sound
Speed of light in a vacuum
Parameter or constant (varies by context)
Parameter or constant (varies by context)
Parameter or constant (varies by context)
Parameter or constant (varies by context)
Candel, a unit of luminous intensity
Group speed or group velocity
Speed of light through medium i
Centimeter, a length unit
cos
Covariance
Continental polar air mass
Crosswind-integrated concentration
<table>
<thead>
<tr>
<th>NOTATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_{dp} )</td>
<td>intermediate calculation parameter for atmospheric optical ray paths</td>
</tr>
<tr>
<td>( D )</td>
<td>daylight duration hours</td>
</tr>
<tr>
<td>( D_A )</td>
<td>data assimilation</td>
</tr>
<tr>
<td>( D_{max} )</td>
<td>total accumulated depth in a rain gauge</td>
</tr>
<tr>
<td>( d )</td>
<td>days, a time unit</td>
</tr>
<tr>
<td>( d_p )</td>
<td>precipitable water</td>
</tr>
<tr>
<td>( d_w )</td>
<td>number of days in a year</td>
</tr>
<tr>
<td>( dRZ )</td>
<td>decibels of Z - units of radar reflectivity</td>
</tr>
<tr>
<td>( d_{phase} )</td>
<td>phase shift</td>
</tr>
<tr>
<td>( E )</td>
<td>collision efficiency</td>
</tr>
<tr>
<td>( E_{eff} )</td>
<td>incoming or outgoing radiative flux at latitude ( \phi )</td>
</tr>
<tr>
<td>( e_0 )</td>
<td>average daily insolation</td>
</tr>
<tr>
<td>( e^f )</td>
<td>total irradiance</td>
</tr>
<tr>
<td>( e^f_{rad} )</td>
<td>incoming or outgoing radiative flux at earth's surface up into the air (in dynamic units W·m(^{-2}))</td>
</tr>
<tr>
<td>( e^f_{rad} )</td>
<td>net radiative flux</td>
</tr>
<tr>
<td>( e'^f_{rad} )</td>
<td>dynamic heat flux in x direction</td>
</tr>
<tr>
<td>( e''_{rad} )</td>
<td>dynamic heat flux in y direction</td>
</tr>
<tr>
<td>( e'_f )</td>
<td>dynamic heat flux in z direction</td>
</tr>
<tr>
<td>( f )</td>
<td>oscillation frequency</td>
</tr>
<tr>
<td>( f_{corr} )</td>
<td>effective surface heat flux</td>
</tr>
<tr>
<td>( F )</td>
<td>flux density</td>
</tr>
<tr>
<td>( F_m )</td>
<td>molecular heat conduction</td>
</tr>
<tr>
<td>( F_{ave} )</td>
<td>average daily insolation</td>
</tr>
<tr>
<td>( F_{net} )</td>
<td>net vector force</td>
</tr>
<tr>
<td>( G )</td>
<td>cyclone graveyard</td>
</tr>
<tr>
<td>( G_{conv} )</td>
<td>gravitational constant</td>
</tr>
<tr>
<td>( G_m )</td>
<td>gigameter, a length unit</td>
</tr>
<tr>
<td>( G_{max} )</td>
<td>gap-geostrophic wind</td>
</tr>
<tr>
<td>( G_{mean} )</td>
<td>geostrophic wind speed</td>
</tr>
<tr>
<td>( GMT )</td>
<td>Greenwich Mean Time</td>
</tr>
<tr>
<td>( H )</td>
<td>geopotential height</td>
</tr>
<tr>
<td>( H_2 )</td>
<td>hydrogen</td>
</tr>
<tr>
<td>( H_2O )</td>
<td>water</td>
</tr>
<tr>
<td>( H_2SO_4 )</td>
<td>sulfuric acid</td>
</tr>
<tr>
<td>( H_c )</td>
<td>hurricane category</td>
</tr>
<tr>
<td>( H_e )</td>
<td>helium</td>
</tr>
<tr>
<td>( h )</td>
<td>depth</td>
</tr>
<tr>
<td>( h_0 )</td>
<td>hour angle</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
X, χ  Chi

Ψ, ψ  Psi

ψ  elevation angle

Ω, ω  Omega

Ω  ohms, a measure of resistance
Ωd  angular velocity
ω  angular frequency
ωe  Earth's rotation rate = 0.0043633 radians/minute

ū  Variant Pi

θ  equinox precession = angle of the perihelion from the vernal equinox

OPERATORS

d( )  total derivative
Δ( )  difference, or change of
( )  (overbar) average or mean of
( )'  (prime) deviation from the mean
[ ]  matrix
|z|  absolute value
( )  amplitude of wave
∫( )  integral of
∑( )  sum of
Π( )  product of
·  multiplication

SUPERSCRIPTS

( )'  (prime) deviation from the mean
( )  first guess
( )′  perturbation
( )″  turbulent variation

SUBSCRIPTS

1  at height 1
2  at height 2
A  any quantity of parcel A
a  analysis
ABL, abl  atmospheric boundary layer
AD  advection
adv  advection
ai  rays going from air to ice
air  of air
avg  average
B  of parcel B

bottom of troposphere
black or dark daisies
BL  boundary layer
BLG  boundary layer gradient (wind)
C  of parcel C
°C  in degrees Celsius
CCN  cloud condensation nuclei
CF  Coriolis Force
CN  centrifugal force
cond  conduction
d  destination
flow in the most narrow part of a channel or mountain pass
E  latent heat
e  environment
earth  of the earth
eff  effective
eq  equilibrium
final  final state
G  ground
bare ground
geostrophic
first guess
H  of heat
ia  rays going from ice to air
destination index
init  initial
j  source index
K  in Kelvin
k  data point index
L  liquid
LCL  lifting condensation level
left  at the left side of a volume or box
liq  liquid
max  maximum
mid  mid-level
at midpoin of column
init  initial value
mix  mixed layer
of a mountain
o  mean background value or reference state
observation
p  parcel
PG  pressure gradient
ref  reference condition
rad  of radiation
right  at the right side of a volume or box
RL  residual layer
RxL  radix layer
s  surface
source index
upstream flow
of the sea-breeze front
SBF  surface
sfc  surface
skin  at the top molecules of the earth's surface
SL  surface layer
SL or sl  sea level
SST  sea surface temperature
STP  standard temperature and pressure
sun  of the sun
T  top of troposphere
t  at time t
TD  turbulent drag
TH  thickness
thermal
turb  turbulent or turbulence
u  component of wind
v  component of wind
w  virtual
W  white or light daisies
water  of water
of parcel X
x  variable in the x direction
x component toward the east
y  variable in the y direction
y component toward the north
z  variable in the z direction
θ  potential temperature

λ  at one wavelength
φ  at latitude
°C  in degrees Celsius
∞  at a far or infinite distance away

SPECIAL SYMBOLS

§  computer spreadsheet should be used to solve this homework exercise
d  dynamic flux
R  gas constant in ideal gas law
Rd  gas constant in ideal gas law for dry air
water vapor
•  key equation or concept
·  multiply operator